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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PADGETT, MARIANNE L	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/802,991	WONG, LAWRENCE D.	
	Examiner	Art Unit	
	Marianne L. Padgett	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/10/07, 8/14/07, 5/5/06 & 3/16/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 29-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 29-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/16/4, 8/14/7*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

1. Applicant's IDS statements & PTO-1449's from 3/16/2004 & 8/14/2007 have been reviewed, where it is noted that the nonpatent literature documents, which were present in the scanned file of the parent case, have been reviewed, however no complete document (i.e. article) for the Loboda et al. 1998 article was found therein, hence this document has been crossed out on the PTO-1449, as not properly available for review. Also the cited article by Hara et al. was not found in the parent's file, only an abstract of the article was retrieved from the file, hence that is what was reviewed & the submitted citation has been so annotated.

The examiner notes that while a PGPub to Edelstein et al. (2005/0194619 A1) is of interest to the state-of-the-art for discussion of SiCOH dielectric materials, which are related to applicant's claimed CDO films, the continuity data listed on this PGPub appears to be incorrect, as a review of the pending application shows no claim of priority from a previous application & the patent listed in the continuity data, PN 6,737,809, is an unrelated subject to a totally different set of inventors & different assignee (Espiau et al. & Luxim Corporation), thus this reference does not appear to be prior art.

2. Claims 1-9 & 29-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preambles of independent claims 1 & 29 are not commensurate in scope with the bodies of the claims, as both preambles require "forming a dielectric film", however there is no requirement in the body of the claim that any such film be formed, although it is noted that a "carbon doped oxide (CDO) film" may be a dielectric, it is not necessarily a dielectric as it in compasses any oxide film that contains any sort of carbon doping, whether intentional or an impurity or residue from the formation process, and not all oxide films are dielectrics. Similarly, not all dielectric films are oxides, hence the preambles & steps of the process are directed to considerably different scopes. Also for independent claim 1, the preamble additionally requires "forming an integrated circuit", however nowhere in the body of the claim,

or in any of the dependent claims, is any integrated circuit ever formed, thus this claim has multiple ways in which the preamble is not commensurate in scope the body of the claim.

Claims 4 & 32, it is unclear what "a **predicted** Kanaya-Okayama range of electrons" (emphasis added) is, or how one would determine this predicted quantity. The examiner notes that on page 7, "the Kanaya-Okayama range" is defined as $r = (2.76x10^{-2}AE_0^{1.67})/\rho Z^{0.89}$, however as Z appears to be said to be the atomic number of accelerated electrons, this formula would appear to be meaningless, because electrons do not have an atomic number, as they are not atoms! The atomic mass (A) of an electron can be input into the formula, but what the density (ρ) of an electron would be is unclear, although it could refer to electron beam current density. The examiner suspects that the disclosure on page 7 is defective, insufficiently describing the variables of the formula, however the result of this is that one cannot use the disclosure to figure out or predict claim values, thus making the meaning of the claimed predicted range unclear (and insufficiently enabled in the specification, see below). It is noted that the abstract of the article by Kanaya et al. is discussing an atomic model giving the potential between electrons & atoms with a formula related thereto, with the article's page 44 discussing the formula for scattering cross section, where Z is the atomic number of the **target**, suggesting to the examiner that the description of A, Z & maybe ρ as defined in applicant's specification is incorrect or incomplete, however while the cited article **might** possibly enable applicant to correct the above confusion (if so applicant should provide careful citations of support with **reasoning** on why the original specification necessitates **any** changes), the actual disclosure in the present specification is not clear, thus making the claims unclear. Also, in order to get a meaningful number out of the empirical formula, one must know what units to employ for the variables, and while the atomic mass (A) **might** be assumed to be atomic weight as listed on a periodic table, and the atomic number (Z) is a unitless value, one still needs to know the units for density & acceleration voltage for which the disclosed empirical formula was designed. A further potential problem, assuming A, Z & ρ are supposed to describe characteristics of the CDO film, is that this film has

a molecular structure having at least two different types of atoms (C & O, others undefined), hence does not have a single atomic number that could be input into the formula, such that it would be unclear whether one is supposed to calculate "r" for each type of atom present in the molecular structure, or the proportional average of their properties, etc., & if calculated individually, whether all such calculations or merely one need to fit the claimed criteria, or what.... As presently written, claims 4 & 32 are impossible to evaluate meaningfully with respect to the prior art, except possibly in terms of intended effect discussed on lines 13-16 of page 7.

In claims 6 & 34, the limitation concerning the dielectric film being an interlevel dielectric is noted to only referrer to the preamble, such that it is unclear how the claimed interlevel dielectric film relates to the CDO film. Furthermore, with respect to claims 6-7 & 34-35, the intent or intended meaning of "preparing a damascene structure in the CDO film" & "filling the damascene structure with a metal" is ambiguous or unclear, as a damascene structure would by a normal definition be a structure that is inlaid with metal, hence if there is already an inlay of metal, which would appear to be required by the "preparing..." limitation, it is indeterminable and unknown what is being filled with metal after the damascene structure has already been formed (i.e. prepared). It is noted that on page 1, lines 17-21 of the specification, there is discussion of copper damascene structures, which clearly indicates that "damascene structures" should be referring to metal structures, with figure 7, referred to on page 7, lines 17-18 illustrating a process for forming such structures (750), although the discussion of figure 7 on page 14 appears to use similar imprecise & confusing use of "damascene structure" as present in the claims, such that from the specification as a whole, clear meaning for these claim limitations as written is not present.

Claims 8 & 36 are unclear as what constitutes "excess metal", as excess metal has not been defined, nor for the claims as written is there necessarily any excess metal present, thus it is unclear from where if it all any metal is being removed.

3. Claims 4 & 32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

See above discussion in section 2 concerning the Kanaya-Okayama range & formula therefore.

4. The disclosure is objected to because of the following informalities: the continuing data provided in the preliminary amendment (10/10/2007, substituted for 3/16/2004) needs to be updated to show the current status of the parent application, which issued as PN 6,734,533 on 5/1/2004.

Appropriate correction is required.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-3, 6-9, 29-31 & 34-37 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Shimada et al. (6,746,969 B2).

Shimada et al. teach a method of manufacturing a semiconductor device, which includes deposition of an insulating film, that is an organic silicon oxide film, such as that deposited from poly-methylsiloxane, which is cured via a combination of heating & electron beam irradiation, with teachings of the EB irradiation energy of about 5-200 keV & specific examples of 6 keV, 10KeV or 1-15 keV. It is taught that the particular EB curing techniques of Shimada et al. improves properties of the dielectric film, such as crack resistance & mechanical strength, while achieving desired low dielectric constants, which is important to its intended use as interlayer dielectric, so that the films durability during subsequent processing, such as dry etching or CMP processing, is excellent. Shimada et al. include disclosures concerning forming patterns in the EB treated/cured dielectric film in which copper wiring is then formed, followed by chemical mechanical polishing, which sequences of steps is considered to read on applicant's claims 6-9 & 34-37. Further note that the organic silicon oxide films or polymethyl siloxane films disclosed by Shimada et al. are considered to read on applicant's carbon doped oxide (CDO) films, as being a subset thereof. Particularly see the abstract, figures 1-2, 4-5 & 8-10; col. 1, lines 28-54; col. 2 for problems in past techniques' results & col. 2, lines 64-col. 3, line 21, plus col. 5, lines 21-44 prior art EB curing techniques; Summary in col. 3; col. 4, lines 11-65, especially 37-41 for basic procedure; col. 5, lines 1-20 & 41-58 for advantages; col. 6, lines 22-39 for important EB parameter & procedural techniques including EB irradiation reaching the inside of the film, plus the start of first embodiment describing figure 1 on line 43, particularly noting lines 53-60 describing wiring grooves filled with Cu metal with the process employing conventional CMP techniques; col. 7, lines 1-58+4 first embodiment procedure, especially noting step 1 & 4 described on lines 7-16 & 33-55; col. 9, lines 15-61 for comparative results; col. 10, especially lines 19-26 & 48-68+ for mechanistic effect, such as e-beam

cutting of CH_3 groups; col. 11, lines 31-44 & 61-col. 12, lines 68 for further advantages & effects of parameters; col. 13, lines 24-27 & 32-53; col. 15, lines 48-54; col. 17, lines 44-56; col. 21, lines 34-col. 22, lines 20 & 47-59; col. 23, lines 60-65; col. 25, lines 25-37; col. 27, lines 34-52; and see col. 28, lines 38-col. 29, lines 22 for further alternatives applicable to the taught process, such as the use of different insulating film materials for the organic silicon oxide, such as SOG films, or employing alternative deposition techniques than spin coating, or use for insulating films other than interlayer dielectrics.

7. Claims rejected under 35 U.S.C. 102(e) as being clearly anticipated by Leu et al. (6,605,549 B2).

Leu et al. (549) are teaching improved nucleation & adhesion of subsequent depositions via CVD or ALD on low dielectric constant (low-k) dielectric layers, inclusive of carbon-doped oxide, that may have been deposited via CVD techniques & patterned for making interconnections with a lower metal layer using single or dual damascene processing techniques known in the art. Various treatments of the dielectric layer to generate or enhance polar groups or polar sites are taught to include processing techniques, such as electron beam treatment, where the electron beam treatment option employs acceleration voltages that may range from about 0.5-20 keV, with about 3 keV exemplified as a preferred parameter when used to treat CDO dielectric layers with electron dosage of about 20 $\mu C/cm^2$ at about 400°C. Leu et al. teach that the dose and acceleration voltage selected will be proportional to the degree and depth of desired surface modification respectively. After this treatment a barrier layer is deposited via CVD or ALD techniques, and may be formed of material such as Ta, TaN, Ti, TiN,..., followed by deposition of a metal seed layer, that may be Cu, then plating of a metal layer, such as copper plating, after which possible subsequent processing includes chemical-mechanical polishing. Particularly see the abstract; figures; col. 1, lines 8-30, especially 8-13 & 25-30; col. 2, lines 1-20 & 49-57; col. 3, lines 1-41, especially 13-17, 28-32 & 38-41; col. 5, lines 1-15 & 26-63; col. 7, lines 34-50; col. a, lines 6-67,

especially 6-11, 25-36, 43 & 65-66; col. 9, lines 22-35; and col. 10, lines 5-24 & 40-45, plus claims 1-4, 7, 9, 11-14 & 16.

8. Claims 1-3 & 29-31 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Livesay et al. (6,132,814).

Claims 4 & 32 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Livesay et al. (6,132,814).

Livesay et al. teach electron beam exposure of siloxane spin-on glass (SOG) deposits, which may be considered a species of deposit covered by "carbon doped oxide", as the glasses are oxide material & the siloxane contains carbon or organic components, thus reads on carbon doping. Livesay et al. combined their electron beam treatment with heating in order to overcome problems noted in the prior art, so that large doses of high-energy electrons may be employed without inducing damage or deleterious effects in the oxide layers. It is taught that sufficient electron energy is selected to fully penetrate the full thickness of the SOG layer, providing 9 keV for a 6000 Å thick film as an example; that their curing techniques provides protection against cracking; and that carbon organic groups are expelled from the oxide film, so that there is no subsequent water uptake by the oxide & increased resistant to wet etch processes. Particularly see the abstract; col. 1, lines 10-29; col. 3, lines 52-col. 4, lines 23 (prior art problems) & lines 62-col. 5, lines 36 & especially lines 60-66; col. 6, lines 16-51+.

Note that while Livesay et al. do not discuss applicant's formula or the "Kanaya-Okayama range", they teach that there electron energy, i.e. acceleration voltage, is sufficient to penetrate the full thickness of the coating being treated, thus while it is impossible to calculate whether the exemplary 9 keV provides the claimed relationship with respect to the disclosed formula due to the deficiencies in the specification (discussed in section 2 above) affecting ability of someone to use the disclosed formula, it is noted that page 7 of the specification when discussing the effect with respect to the Kanaya-Okayama range teach "Typically, the entire cross-section of the CDO film will be exposed to electron flux and thus in preferred

embodiment of the Kanaya-Okayama range is greater than the thickness of the CDO film", which appears to have the equivalent meaning of the teachings of Livesay et al., which require the electron energy to fully penetrate the full thickness of the layer, hence it would appear that Livesay et al's exemplary energy & film thickness inherently reads on applicant's claimed formula due to equivalent effects occurring. Alternately, it would've been obvious to one of ordinary skill in the art when employing electron beams for curing a film to be sure to use sufficient energy to enable sufficient dosage of electrons to penetrate the entire thickness i.e. cross-section, of the film in order to effect the desired curing of the film, otherwise uncured material would remain at deeper levels of the coating.

9. Claims 1-3 & 29-31 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Moghadam et al. (6,936,551 B2).

Claims 4 & 32 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Moghadam et al. (6,936,551 B2).

In Moghadam et al. (6,936,551 B2), see abstract; col. 3, lines 55-col. 4, lines 27; col. 8, lines 10-col. 9, lines 44, especially note in col. 8, lines 18-22 energy beam dosages are taught to vary in the range of about 0.1-100 KeV, where dose & energy are selected to be proportional to the thickness of the film treated. Maghadam et al. teach the deposition of dielectric films including via CVD or spin-on deposition, etc., where deposited low dielectric films are taught to contain silicon, oxygen & carbon, with carbon content possibly being between about 10-30 atomic %, which is considered to read on the claimed carbon doped oxides. Note that the teaching concerning the energy dose being proportional to the thickness of the film, is considered to either read inherently on the disclosed intent of applicant's "range" of claims 4 & 32, or alternately to have been obvious for reasons as discussed in section 8 above.

10. Claims 4 & 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. or Livesay et al. or Leu et al. or Moghadam et al. (6,936,551 B2) as applied to claims 1-9 & 29-37 as set forth above, and further in view of Thompson (4,027,052).

While none of the above primary references employ a formula as provided in applicant's specification, Thompson, who is curing a polyvinyl ferrocene layer via electron beam, teaches that electron beam voltage is determined by the desired crosslinking polymer material, where optimum conditions for crosslinking are based on desired production of gelation at the interface, and Thompson provides an equation for determining such voltages in terms of thickness of the film (abstract; col. 6, lines 64-col. 7, line 15), hence considering these teachings of Thompson would have general applicability to any e-beam layer curing process, it would have been obvious to one of ordinary skill in the art to apply equivalent concepts to any of the primary references e-beam treatments in order to provide sufficient e-beam energy to accomplish taught treatments by deriving an analogous formula for calculating required electron beam voltages to apply to the particular materials of the primary references in order to produce desired treatment effects, which in all cases may be applied to the entire thickness of the taught dielectric material being electron being treated.

11. Claims 1 & 29 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Noriko Iwamoto (JP 62-132326 A).

Claims 2-7 & 30-35 are rejected under 35 U.S.C. 103(a) as obvious over Iwamoto (JP 62-132326 A).

Iwamoto teaches forming an interlayer insulating film for multiplayer interlayer insulating film that is electron beam patterned, where the film is made of a "silicon organic acid oxide compound", which as described in the English abstract and illustrated in the Japanese patent, has a silicon oxide structure, with attached organic groups, thus reads on the claimed CDO film. As electron beams are impinged on this film in order to pattern it, the film is being treated with electron beams, thus reading on the independent claims' limitations, as the claims as written are completely silent as to the effect of the electron beam has on the CDO film when treating.

While the English abstract does not teach any particular electron beam energies, nor discussed subsequent steps after patterning of the interlayer insulating film (the Japanese patent also does not appear to have energy disclosures), it would've been obvious to one of ordinary skill in the art to employ electron beam energies sufficient to remove or etch the disclosed organic silicon oxides, with the expectation of useful values being greater than those of the minimum of the claimed ranges & exceeding the thickness of the "Kanaya-Okayama range", as the energy necessary to ablate or etch is higher than the energy necessary to cure or treat in a nondamaging manner, where one of ordinary skill in the art would have been expected to employ routine experimentation &/or known physical relationships to calculate required energy to determine suitable EB energies necessary to produce the taught e-beam patterning. It would've been further obvious to employ the taught multilayer interconnect structure for the intended purpose, which would necessitate depositing conductive wiring in the patterned structure, where it is old and well known in the art to employ metals for such purposes. Note that as this abstract suggests that any such deposited metal is essentially an inlay, this is considered to be consistent with the claimed damascene structure.

12. Claims 1-9 & 29-37 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, or 1-12, or 1-18, or 1-11 of U.S. Patent No. 6,417,098 B1, or 6,432,811 B1, or 6,703,324 B2, or 6,984,518 B2 in view of Iwamoto (JP), or Shimada et al. or Livesay et al. or Leu et al. or Moghadam et al., optionally in view of Thompson (4,027,052) for claims 4 & 32.

The patented claims are all directed to use of dielectric material that is cured and/or patterned to make interlayer dielectric structures in which metal, such as copper, is deposited & in (098), (324) & (581) CPM is performed thereon. With respect to the dielectric film (098) explicitly claims "carbon-doped oxide layer", (811), (581) & (324) claim "an oxide of silicon", where all these patented claims differ from the present claims by not having any claims direct to electron beam treatment (i.e. none of the

claims to patterning &/or curing, specify the means thereof) of the dielectric layer, which encompasses CDO layers either explicitly or as a narrower overlapping species. The secondary references of Iwamoto (JP), or Shimada et al., or Livesay et al., or Leu et al., or Moghadam et al (all discussed above in sections 6-11), are all directed to analogous processes, where e-beam treatment is used to effect either a superior curing techniques than would be produced by thermal curing, or to provide a superior deposition surface for subsequent depositions consistent with those desired in the patented claims, or to provide patterning the use of an electron beam, where all these electron beam treatment techniques of the secondary references are applied to dielectric materials used in structures as in the patented claims & composed of compositions consistent with patented claims, as well as the presently claimed CDO film in the instant application, hence it would've been obvious to one of ordinary skill in the art to apply electron beam treatment for any of the reasons as supplied by the references for the benefits taught therein (also using specific materials as discussed in the references) & in order to accomplish the objectives of the claims, as these techniques are consistent with & complementary to the claimed limitations. Note with respect to electron beam energy requirements, the teachings of each reference is relevant to its combination & reasons for obviousness with respect to energy choice, as discussed above, are also applicable here.

13. Other art of interest relating to claimed electron beam usage on relevant dielectric material include Demos et al. (2006/0171653 A1); Kloster et al. (6,867,125 B2); He et al. (6,998,216 B2); Yim et al. (2006/0043591 A1); & Clevenger et al. (2007/0059922 A1), however none of these references are prior art.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MLP/dictation software

10/16-18/2007

MARIANNE PADGETT
PRIMARY EXAMINER